

## ABSTRACT

**[0082]** A semiconductor wafer support assembly and method of fabricating the same. In one embodiment, the method and resulting assembly include attaching a pedestal joining-ring to a bottom surface of a ceramic puck. Low temperature brazing a composite cooling plate structure to the bottom surface of the ceramic puck, where the pedestal joining-ring circumscribes the composite cooling plate structure. Thereafter, a pedestal is electron-beam welded to the pedestal joining-ring. In a second embodiment, for a full area temperature controlled assembly, a method and assembly include a ceramic puck having a wafer support surface, and a composite cooling plate structure having a diameter at least equal to the wafer support surface. A pedestal joining-ring is attached to a bottom surface of the composite cooling plate structure. A bottom surface of the ceramic puck is low temperature brazed to the composite cooling plate structure, and then a pedestal is electron-beam welded to the pedestal joining-ring. In a third embodiment, for a full area temperature controlled semiconductor wafer support assembly, a method and assembly include a ceramic puck having a wafer support surface, and an aluminum-containing composite cooling plate structure having a diameter at least equal to the wafer support surface. A pedestal joining-ring is low temperature brazed to a bottom surface of the composite cooling plate structure. A bottom surface of the ceramic puck is low temperature brazed to the composite cooling plate structure. Then a pedestal is electron-beam welded to the pedestal joining-ring.